

# Navigating the New Jersey & Washington State Stormwater Programs as Models for Approving Manufactured Treatment Devices

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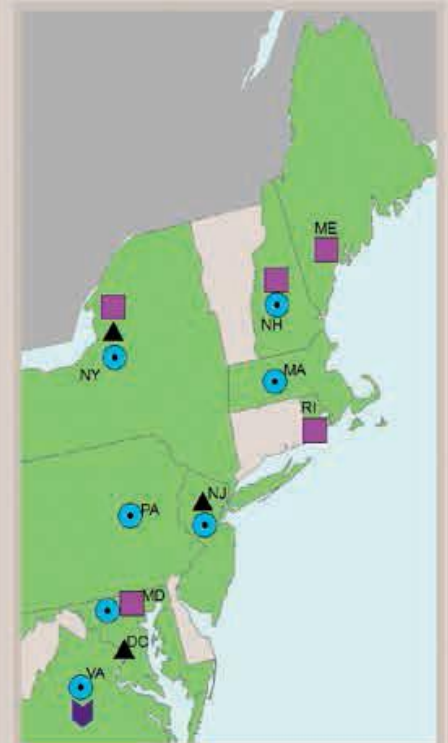
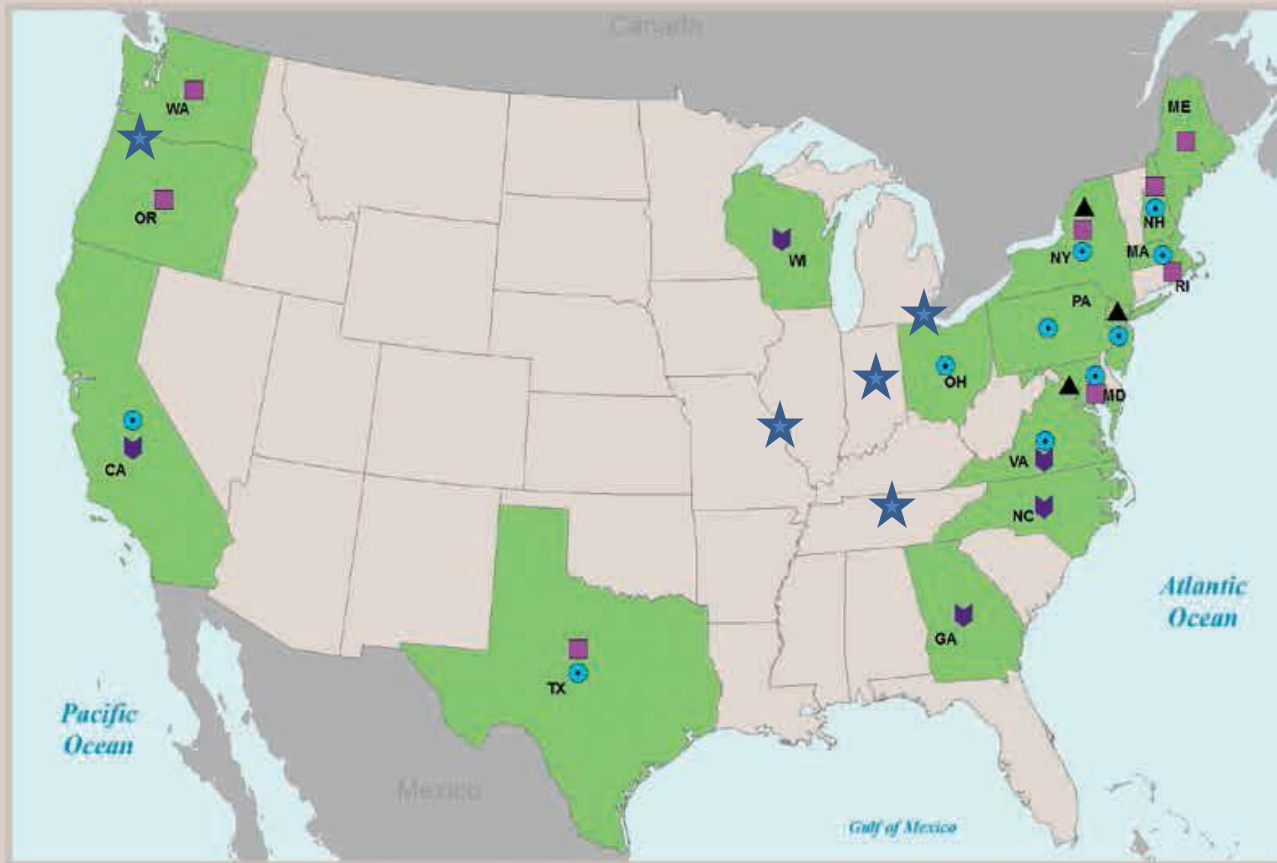
**47<sup>th</sup> Environmental Show of the South**

May 16-18, 2018  
Chattanooga, Tennessee

# A bunch of stormwater programs...no consistency

## Distribution of state/regional stormwater testing/evaluation programs

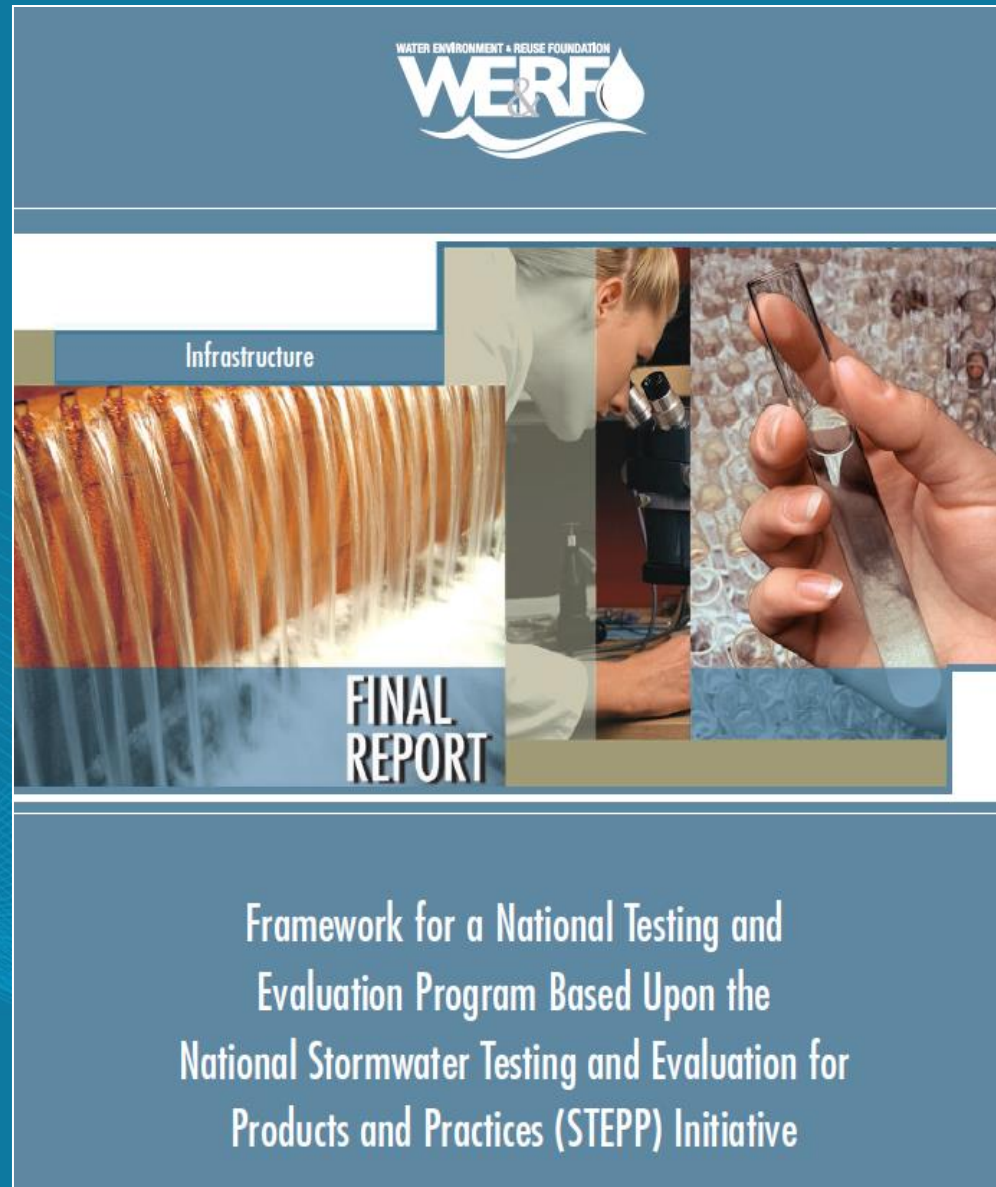
- ▲ NJCAT 2013; Recognizes NJCAT
- Recognizes TAPE; WA TAPE
- 2003 TARP Tier II; Recognize TARP Tier II
- ▼ CALTRANS; GTAP; WI Stormwater Post-Construction Technical Standard 1006; PEP (Preliminary Evaluation Period Program); VTAP (Withdrawn)
- ★ Select Cities/Counties



Then in mid-2016...



- ❖ *Proposes a National program to evaluate products and practices.*
- ❖ *Draws upon New Jersey & Washington State stormwater programs for MTD evaluations.*





# ***STEPP draws on 2 programs as models for approving (evaluating) Manufactured Treatment Devices (MTDs)...***



STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**NJ STORMWATER.ORG**  
*Stormwater in New Jersey*

***Lab testing protocol***



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

***Field testing protocol***

## A Spirited Debate: Lab vs. Field Testing



- Lab testing provides repeatable and defensible results under controlled conditions to allow for side by side comparisons of MTD performance testing.
- Field testing is a logical progression from lab testing and provides long term, real world results under random storm conditions under which an MTD would be expected to encounter.

# Two Step Process for NJDEP “Certification”

## Step 1: NJCAT “Verification”



[www.njcat.org](http://www.njcat.org)

## Step 2: NJDEP “Certification” (if eligible)



STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**Nj STORMWATER.ORG**  
*Stormwater in New Jersey*

[www.njstormwater.org/treatment.html](http://www.njstormwater.org/treatment.html)





STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**NJ STORMWATER.ORG**  
*Stormwater in New Jersey*

## **NJCAT Verification vs. NJDEP Certification**

- ***NJCAT Verification provides independent documentation of a protocol-based performance claim for an MTD in either a lab and/or field test setting.***
- ***NJDEP Certification allows an eligible MTD to be specified within New Jersey under conditions specific to state stormwater rules.***

***We'll talk about eligibility later.....***

## ***Process for Approval of MTDs***

New Jersey Department of Environmental Protection  
Process for Approval of Use for Manufactured Treatment Devices  
January 25, 2013

This document outlines the process for a stormwater manufactured treatment device (MTD) to be approved by the New Jersey Department of Environmental Protection (NJDEP) in compliance with the Stormwater Management rules, N.J.A.C. 7:8. Prior to a MTDs entrance into the NJDEP process, the MTD must obtain Verification through the New Jersey Corporation for Advanced Technology (NJCAT). The process for NJCAT Verification is available at [www.njcat.org](http://www.njcat.org) entitled "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology: For use in accordance with the Stormwater Management Rules, N.J.A.C. 7:8". In addition to these process documents there are protocols for sedimentation and filtration MTDs that must be used for approval, the protocols are available at [www.njstormwater.org](http://www.njstormwater.org).

### **NJDEP Process**

Upon successful completion of the technical and regulatory standards and the completion of the reporting of those standards in the NJCAT Verification Report, NJCAT will provide NJDEP's Stormwater Management Unit a link to their website where the Verification Report can be found. In addition to the Verification Report link, NJCAT will supply the MTD name, the MTD manufacturer name and the respective TSS percent removal rate.

The NJCAT Verification will include the following components: Description of Technology, Laboratory Test Setup, Performance Claims, Supporting Documentation, Design Limitations, Maintenance Plans, Statements of Compliance and a Verification Appendix. The Verification Appendix will highlight and translate the design specifications found in the rest of the Verification Report to the design engineer.

Formal representation of a NJDEP approval will be established on the NJDEP stormwater website at [www.njstormwater.org](http://www.njstormwater.org). The website will contain the MTD name, the MTD manufacturer name and the respective TSS percent removal rate. Upon approval, the MTD can be used for compliance with the Stormwater Management rule as long as the conditions of the NJCAT Verification are met.

**NJDEP Lists MTD Certifications @**  
**[www.njstormwater.org/treatment.html](http://www.njstormwater.org/treatment.html)**

Link to NJCAT Verification Database

Links to NJDEP Certifications

Governor Chris Christie • Lt. Governor Kim Guadagno

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STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**Nj STORMWATER.ORG**  
*Stormwater in New Jersey*

NJStormwater.org Home | NJDEP Home | NJDEP Online

### Stormwater Management

- Green Infrastructure in NJ
- Stormwater Management Rule
- Stormwater Management Rule FAQs
- NJ Stormwater BMP Manual
- Maintenance Guidance
- BMP Manual Chapters for Comment
- MTD Certifications and Guidance
  - NJCAT Verification Database
  - Stormwater MTD Protocols and Guidance Documents
  - Stormwater MTD Links
  - Stormwater MTD Archive
  - Expired Stormwater MTDs
- Additional Guidance Documents

### Stormwater Permitting

- Municipal Stormwater Regulation
- Stormwater Training
- General Stormwater Permits
- Individual Stormwater Permits
- Permit Applications and Checklists

### Program Links

- NJ Stormwater
- Bureau of Nonpoint Pollution Control
- Division of Water Quality
- Clean Water NJ

## Stormwater Manufactured Treatment Devices

An MTD is required to be NJCAT verified and NJDEP certified when the MTD is used to satisfy the requirements of the [Stormwater Management rule \(N.J.A.C. 7:27\)](#), as a result of triggering the requirements for major development.

For projects receiving New Jersey Environmental Infrastructure Financing Program ([NJEIFP](#)) funding, an MTD must be either: 1) NJCAT verified and NJDEP certified or 2) installed using the [NJEIFP MTD Funding Policy](#).

An MTD which is not NJCAT verified or NJDEP certified may be used as long as the MTD is not intended to satisfy the requirements of the [Stormwater Management rule](#) and is not subject to [NJEIFP MTD Funding Policy](#).

Please note that any MTD installed should be listed on the MS4 permittee's inventory of stormwater management measures and must be properly maintained by the responsible party. Other state, federal and local requirements may apply.

**NOTICE (January 13, 2017)**

NJDEP Field Test Certifications for MTDs expired December 1, 2016. As such, MTDs that held only the Field Test Certification can no longer be used in new installations to satisfy the requirements of the Stormwater Management rule. However, projects that have been deemed administratively complete by the Division of Land Use Regulation for a permit requirement stormwater review as of December 1, 2016 may continue to utilize the design as specified in the prior certification letters. If no permit is required from the Division of Land Use Regulation, projects that have received preliminary or final site plan approval from the municipality as of January 13, 2017 may continue to utilize the design as specified in the prior certification letters. Projects that have received preliminary or final site plan approval from the municipality as of January 13, 2017 must comply with the updated procedures and protocols dated January 25, 2013. Guidance for obtaining verification and certification can be found at the NJDEP website at [http://www.njstormwater.org/mtd\\_guidance.htm](http://www.njstormwater.org/mtd_guidance.htm).

The list of MTDs with expired Field Test Certifications can only be found at the Expired Stormwater MTDs page located at [http://www.njstormwater.org/mtd\\_expired.htm](http://www.njstormwater.org/mtd_expired.htm).

The table below includes the listing of MTDs that are NJCAT verified and NJDEP certified under the updated procedures and protocols dated January 25, 2013.

[Click here](#) to link to NJCAT Verification Database

| Stormwater Management Manufactured Treatment Devices Certified by NJDEP          | MTD Laboratory Test Certifications | Superseded Certifications | Certified TSS Removal Rate | Maintenance Plan |
|----------------------------------------------------------------------------------|------------------------------------|---------------------------|----------------------------|------------------|
| Aqua-Filter Stormwater Filtration System by AquaShield, Inc.                     | Certification                      |                           | 80%                        | Plan             |
| Aqua-Swirl By AquaShield, Inc.                                                   | Certification                      | Superseded                | 50%                        | Plan             |
| BayFilter by BaySaver Technologies, LLC                                          | Certification                      |                           | 80%                        | Plan             |
| Continuous Deflective Separator (CDS) Unit by CONTECH Stormwater Solutions, Inc. | Certification                      | Superseded                | 50%                        | Plan             |
| Downstream Defender by Hydro International, Inc.                                 | Certification                      | Superseded                | 50%                        | Plan             |
| Dual Vortex Separator by Oldcastle Stormwater Solutions                          | Certification                      | Superseded                | 50%                        | Plan             |
| Filterra Bioretention System by Contech Engineered Solutions                     | Certification                      | Superseded                | 80%                        | Plan             |
| First Defense HC (FDHC)                                                          |                                    |                           |                            |                  |



[www.njcat.org](http://www.njcat.org)

- About Us
- Verification Process

## Technology Verification

The Energy and Environmental Technology Verification (EETV) Act at N.J.S.A. 13:1D-134 et seq., establishes the guidelines for a verification and certification process to approve the use of innovative energy and environmental technologies that benefit the environment and economy of New Jersey. The New Jersey Legislature found that, in establishing the technology verification and certification program, it is in the public's interest to encourage the commercial development and use of new technology-based environmental and energy related products, services and systems that abate and prevent environmental pollution and promote energy conservation in the most cost-effective and environmentally efficient manner in the State.



## Highlights

Although innovative environmental and energy technologies often consume fewer natural resources than traditional methods, they encounter numerous technical, financial and regulatory impediments. Over the years, NJCAT has broken down many of the barriers, but there are still daunting challenges facing innovative technologies.

### Stormwater Treatment Systems

Stormwater Management Technologies in particular are difficult to evaluate. Pollutant removal performance depends upon many factors, e.g., influent particulate size distribution, influent pollutant concentration (loading), stormwater flow rate, sump design and capacity, and maintenance. NJCAT's involvement and activities over the past decade in identifying and evaluating a number of pre-manufactured stormwater treatment devices has created the knowledge and experience base necessary to effectively and confidently assess anticipated sediment removal performance.

The New Jersey Stormwater rules (35 N.J.R. 154) clearly establish that manufactured stormwater

## News

### About NJCAT

NJCAT was created to promote in New Jersey the retention and growth of technology-based businesses in emerging fields such as environmental and energy. NJCAT provides innovators with the regulatory, commercial, and technological assistance required to bring their ideas to market successfully. Specifically, NJCAT functions to:



- \* advance policy strategies and regulatory mechanisms to promote technology commercialization,


- \* identify, evaluate, and recommend specific technologies for which the regulatory and commercialization process should be facilitated,

- \* establish relationships/alliances to bring new technologies to market and new business to the state, and

- \* assist in the identification of markets and applications for commercialized technologies.

Operating as a public private partnership is the cornerstone of the NJCAT programs; in this manner, the commercial marketplace has direct input to the technology development and commercialization process and the public sector gains confidence in technology solutions through reliance on an independent honest broker examination of technology performance.

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Center for Environmental Systems  
Stevens Institute of Technology  
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[973-879-3056 \(M\) rsmagee@rcn.com](mailto:rsmagee@rcn.com)



Corporation for Advanced Technology

Energy and Environmental Technologies

[About Us](#)  
[Verification Process](#)

# Lab Verifications

## Stormwater Technologies: Laboratory Verified

| Company                          | Product                                                     | Verification Date                                | Link to Report           |
|----------------------------------|-------------------------------------------------------------|--------------------------------------------------|--------------------------|
| AquaShield Inc.                  | Aqua-Filter                                                 | Sept. 2005, Updated December 2005, Addendum 2007 | <a href="#">Download</a> |
| AquaShield Inc.                  | Aqua-Swirl                                                  | Sept. 2005, Updated December 2005                | <a href="#">Download</a> |
| AquaShield, Inc.                 | Aqua-Filter Stormwater Filtration System with Perlite Media | March 2017                                       | <a href="#">Download</a> |
| AquaShield, Inc.                 | Aqua-Swirl Stormwater Treatment System                      | November, 2016                                   | <a href="#">Download</a> |
| BaySaver Technologies            | BayFilter                                                   | June 2008                                        | <a href="#">Download</a> |
| BaySaver technologies            | BaySeparator                                                | December 2004                                    | <a href="#">Download</a> |
| BaySaver Technologies, LLC       | BayFilter Enhanced Media Cartridge                          | November, 2016                                   | <a href="#">Download</a> |
| Bio Clean Environmental Services | Kraken Membrane Filtration System                           | April 2016                                       | <a href="#">Download</a> |

[process/technology-verification-database.html](http://process/technology-verification-database.html)

|                                |                                                              |                                      |                          |
|--------------------------------|--------------------------------------------------------------|--------------------------------------|--------------------------|
| Environment 21 LLC             | V2B1                                                         | March 2009                           | <a href="#">Download</a> |
| Fresh Creek Technologies Inc.  | SiteSaver Stormwater Treatment Device                        | February 2016, Updated January 2017  | <a href="#">Download</a> |
| FreshCreek Technologies, Inc.  | StormTrap SiteSaver - 4 Hydrodynamic Separator               | June 2017                            | <a href="#">Download</a> |
| FreshCreek Technologies, Inc.  | StormTrap SiteSaver-4 Hydrodynamic Separator: Large PSD      | August 2017                          | <a href="#">Download</a> |
| Hydro International            | First Defense HC                                             | September 2016                       | <a href="#">Download</a> |
| Hydro International            | Up-Flo Filter (with Filter Ribbon Media)                     | December 2016                        | <a href="#">Download</a> |
| Hydro International Inc        | Downstream Defender                                          | December 2015                        | <a href="#">Download</a> |
| Hydro International Inc        | First Defense HC                                             | February 2016, Updated January 2017  | <a href="#">Download</a> |
| Hydro International Inc        | Up-Flo Filter                                                | November 2008                        | <a href="#">Download</a> |
| Hydro International Inc.       | Downstream Defender                                          | August 2015, Updated January 2017    | <a href="#">Download</a> |
| Hydroworks LLC                 | Hydroguard                                                   | July 2009                            | <a href="#">Download</a> |
| Imbrium Systems                | Stormceptor OSR                                              | August 2007                          | <a href="#">Download</a> |
| Imbrium Systems                | Stormceptor STC                                              | September 2004, Addendum June 2010   | <a href="#">Download</a> |
| Kristar Enterprises Inc.       | FlipGard Dual-Vortex                                         | July 2009                            | <a href="#">Download</a> |
| Lane Enterprises Inc.          | Stormkeeper Chamber Sediment Strip                           | May 2017                             | <a href="#">Download</a> |
| Oldcastle Precast Stormwater   | Oldcastle PerkFilter System with ZPC Media                   | May 2017                             | <a href="#">Download</a> |
| Oldcastle Stormwater Solutions | Dual Vortex Separator (DVS)                                  | July 2015, Updated January 2017      | <a href="#">Download</a> |
| Suntree Technologies Inc.      | NS Evaluation with 100 micron Particles                      | June 2013                            | <a href="#">Download</a> |
| Suntree Technologies Inc.      | Nutrient Separating Baffle Box                               | November 2008, Addendum October 2013 | <a href="#">Download</a> |
| Suntree Technologies Inc.      | Nutrient Separating Baffle Box with Hydro-Variant Technology | October, 2016                        | <a href="#">Download</a> |
| Terre Hill Stormwater Systems  | Terre Kleen Hydrodynamic Separator                           | January 2017                         | <a href="#">Download</a> |
| Terre Hill Stormwater Systems  | Terre Kleen Separator                                        | August 2007                          | <a href="#">Download</a> |

## Stormwater Technologies: Field Verified

| Company                      | Product                               | Verification Date                 | Link to Report           |
|------------------------------|---------------------------------------|-----------------------------------|--------------------------|
| AquaShield Inc.              | Aqua-Filter                           | November 2013                     | <a href="#">Download</a> |
| AquaShield Inc.              | Aqua-Swirl                            | November 2012                     | <a href="#">Download</a> |
| CONTECH Stormwater Solutions | Continuous Deflective Separator (CDS) | January 2010, Amended August 2012 | <a href="#">Download</a> |
| CONTECH Stormwater Solutions | Media Filtration System (MFS)         | January 2010                      | <a href="#">Download</a> |
| CONTECH Stormwater Solutions | StormVault                            | August 2007                       | <a href="#">Download</a> |
| CONTECH Stormwater Solutions | Vortextechs                           | April 2011                        | <a href="#">Download</a> |
| Hydro International Inc.     | Up-Flo Filter                         | January 2015                      | <a href="#">Download</a> |
| Imbrium Systems              | Jellyfish                             | January 2012                      | <a href="#">Download</a> |

## Stormwater Technologies: For Public Comment

| Company                    | Product                                   | Public Comment Period Opens | Public Comment Period Closes | Link to Report           |
|----------------------------|-------------------------------------------|-----------------------------|------------------------------|--------------------------|
| BaySaver technologies, LLC | BaySaver Barracuda Hydrodynamic Separator | August 2, 2017              | August 31, 2017              | <a href="#">Download</a> |

## Small-scale Co-generation Technologies

| Company                    | Product                | Verification Date | Link to Report           |
|----------------------------|------------------------|-------------------|--------------------------|
| Aegis Energy Services Inc. | AEGEN TP-75 CHP Module | February 2014     | <a href="#">Download</a> |

NJDEP 2009

ic Comment

NJCAT MTD Verifications @

[www.njcat.org/verification-process/technology-verification-database.html](http://www.njcat.org/verification-process/technology-verification-database.html)

Field Verifications per TARP or NJDEP 2009

Lab Verifications open for Public Comment

# Ever heard of TARP? Well, it is no longer applicable to NJDEP

The **T**echnology **A**cceptance **R**eciprocity  
**P**artnership

*Protocol for*

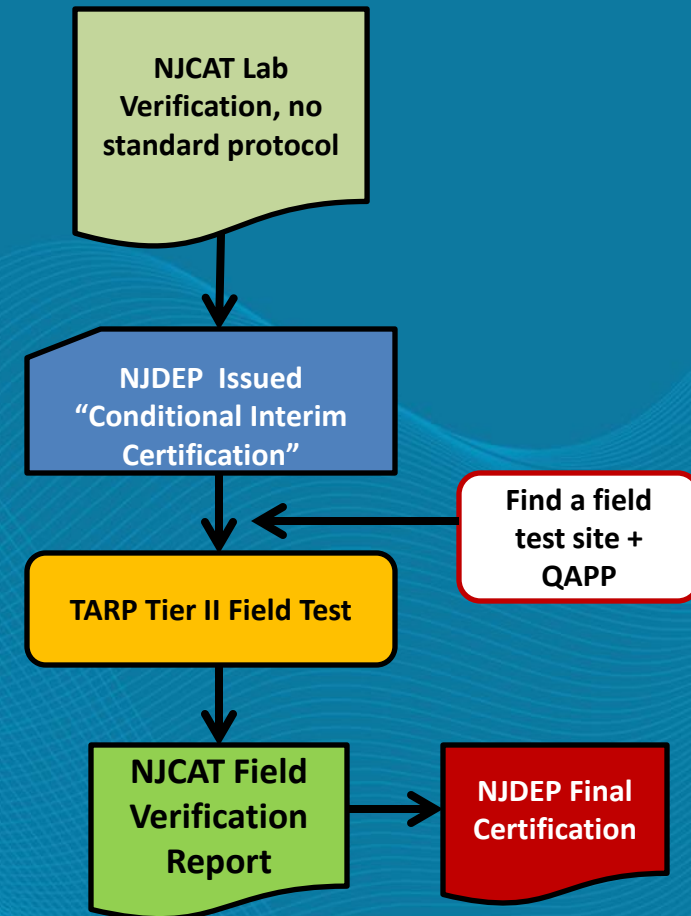
**Stormwater Best Management Practice  
Demonstrations**

Endorsed by  
California, Massachusetts, Maryland,  
New Jersey, Pennsylvania, and Virginia

Final Protocol 8/01  
Updated: 7/03



## Original NJDEP Certification Process



There was no TARP Tier I





STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**NJ STORMWATER.ORG**  
*Stormwater in New Jersey*

***New Jersey Lab Testing Protocols for HDSs and Filters***

New Jersey Department of Environmental Protection  
Laboratory Protocol to Assess Total Suspended  
Solids Removal by a Hydrodynamic Sedimentation  
Manufactured Treatment Device

January 25, 2013

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New Jersey Department of Environmental Protection  
Laboratory Protocol to Assess Total Suspended  
Solids Removal by a Filtration Manufactured  
Treatment Device

January 25, 2013

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<http://www.njstormwater.org/treatment.html>



STATE OF NEW JERSEY  
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[NJStormwater.org Home](#) | [NJDEP Home](#) | [NJDEP Online](#)

### Stormwater Management

- ▶ Green Infrastructure in NJ
- ▶ Stormwater Management Rule
- ▶ Stormwater Management Rule FAQs
- ▶ NJ Stormwater BMP Manual
- ▶ Maintenance Guidance
- ▶ BMP Manual Chapters for Comment
- ▶ MTD Certifications and Guidance
  - NJCAT Verification Database
  - Stormwater MTD Protocols and Guidance Documents
  - Stormwater MTD Links
  - Stormwater MTD Archive
  - Expired Stormwater MTDs
- ▶ Additional Guidance Documents

### Stormwater Manufactured Treatment Device Protocols and Guidance Documents

- ▶ NJDEP MTD Process - January 25, 2013, pdf, 70kb
- ▶ NJCAT MTD Process - January 25, 2013, pdf, 182 kb
- ▶ HDS Protocol - January 25, 2013, pdf 350 kb
- ▶ Filter Protocol - January 25, 2013, pdf, 290kb
- ▶ Funding of MTDs by the New Jersey Environmental Infrastructure Financing Program, pdf 112kb
- ▶ Transition for Manufactured Treatment Devices July 15, 2011, pdf, 29kb
- ▶ Interim Process for Certification of Manufactured Treatment Devices - Posted 4/23/09, pdf 72kb

[http://www.njstormwater.org/mtd\\_guidance.htm](http://www.njstormwater.org/mtd_guidance.htm)



## Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology

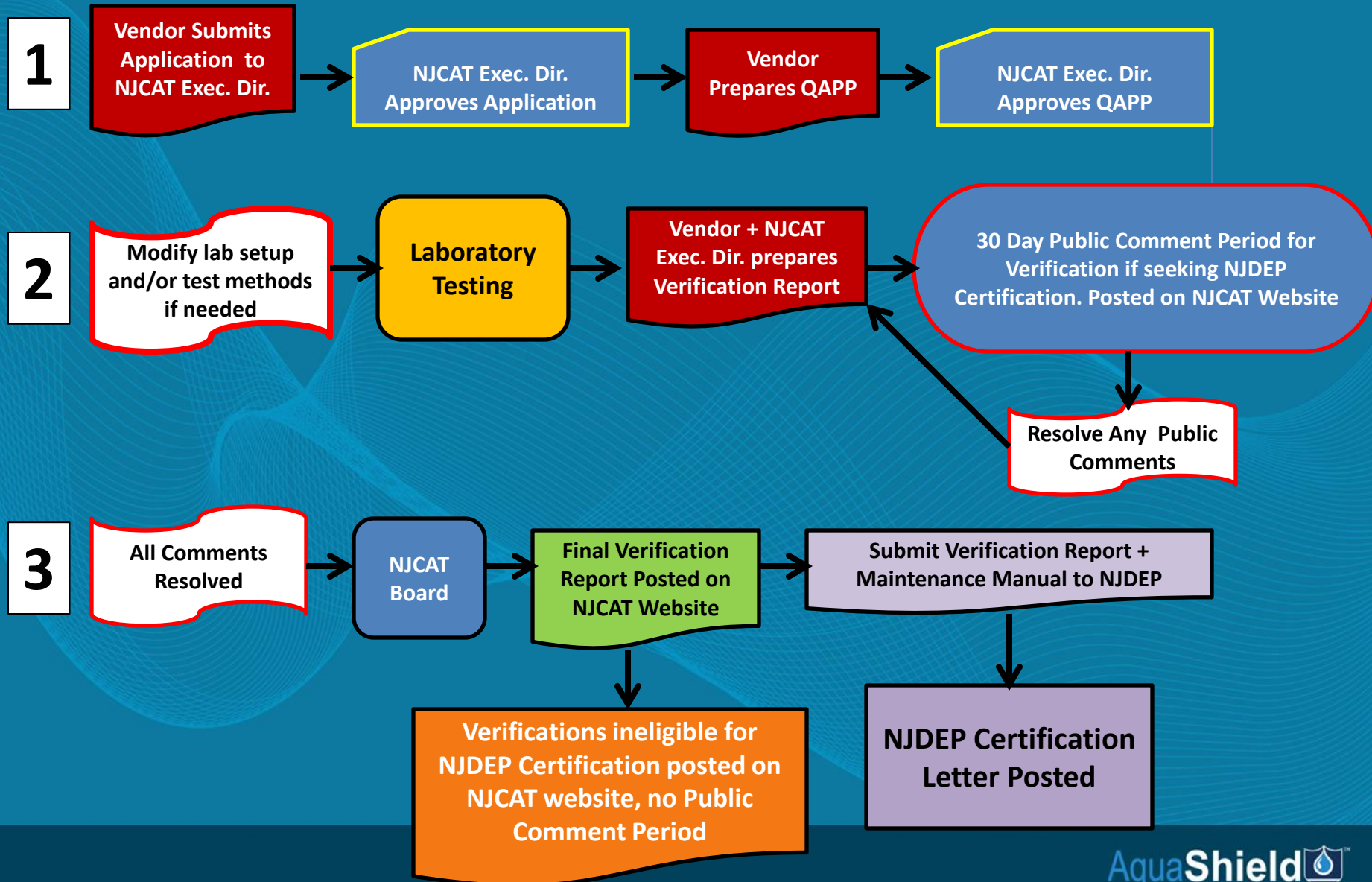
For use in accordance with the Stormwater Management Rules,  
N.J.A.C. 7:8

January 25, 2013

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# NJCAT Verification + NJDEP Certification Process



# Example NJDEP Certification Letter (1<sup>st</sup> page)

## **NJDEP Limits:**

**HDSs to 50% annual TSS**

**Filters to 80% annual TSS**

**Regardless of whether the  
NJCAT Verification is for a  
greater annual TSS removal  
efficiency percentage.**

KIM GUADAGNO

CHRIS CHRISTIE  
*Governor*

*Lt. Governor*



**State of New Jersey**

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control

Division of Water Quality

401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

[http://www.state.nj.us/dep/dwq/bnpc\\_home.htm](http://www.state.nj.us/dep/dwq/bnpc_home.htm)

BOB MARTIN  
*Commissioner*

March 15, 2017

Mark B. Miller, Research Scientist  
AquaShield™, Inc.  
2733 Kanasita Drive, Suite 111  
Chattanooga, Tennessee 37343

Re: Revised MTD Lab Certification  
Aqua-Swirl® Stormwater Treatment System by AquaShield™, Inc.

TSS Removal Rate 50%

Dear Mr. Miller:

This revised certification letter supersedes the Department's prior certification dated December 1, 2016. This revision only removes the Required Sediment Removal Interval column from Table A-1 in order to avoid confusion regarding maintenance requirements. All other conditions of the certification remain unchanged.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). AquaShield™, Inc. has requested an MTD Laboratory Certification for the Aqua-Swirl® Stormwater Treatment System, which is a vortex hydrodynamic separator.

The verification is subject to the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated November 2016) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

?

If following NJDEP as a model for local approval...



Require only NJCAT Verification?

*Then which Verification?*

- ❖ 2013 Lab + MTDs Ineligible for Certification
- ❖ CIC Lab (Certifications expired)
- ❖ NJDEP 2009 Field (Certifications expired)
- ❖ TARP Tier II Field (Certifications expired)

OR...



STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**Nj STORMWATER.ORG**  
*Stormwater in New Jersey*

Require NJDEP Certification per 2013 Protocol?

***"Level Playing Field"***, all hold Final Certification



## Consider 4 fundamental aspects of the NJDEP/NJCAT MTD Process

1. NJDEP Certification is specific to New Jersey stormwater rules. An MTD must hold NJDEP Certification in order to be specified in New Jersey.
2. NJDEP Certification does not necessarily carry a higher level of technical scrutiny beyond that of an NJCAT Verification. However, NJDEP reviews maintenance manuals, NJCAT does not. NJDEP Certifications includes Maintenance Manual as part of Cert. Letter.
3. Not all NJCAT Verifications for an MTD are eligible for NJDEP Certification when there is a deviation from the protocol. This has significant ramifications for MTD sizing outside of NJ.
4. An NJCAT Verification can be issued for an MTD technology that is not recognized by NJDEP to be eligible for Certification. This has significant ramifications for MTD technology approval outside of NJ.

## Let's look closer at NJCAT/NJDEP Aspects #3 & #4

**#3: Deviation from Protocol - Sizing:** An MTD test follows the protocol but uses a coarser PSD. An NJCAT Verification could still be obtained but that test would **not be eligible** for NJDEP Certification since the test purposefully deviated from the protocol to obtain a more favorable performance result. If an agency outside of NJ accepts NJCAT verifications only, then this test would allow for MTD sizing to be more favorable (smaller MTD) compared to those MTDs that tested to the protocol using the finer specified PSD (larger MTD). Could this lead to undersizing?

**#4: Ineligible Technology for Certification:** The NJCAT Application will identify whether an MTD technology is accepted by NJDEP, and whether the proposed MTD test will be eligible for NJDEP Certification. For example, NJDEP considers underground infiltration structures (inclusive of fabric) not to be filtration MTDs and not eligible for Certification. However, NJCAT can issue a Verification for that technology as a pretreatment device but not NJDEP eligible. Agencies outside of New Jersey can then make their determination whether (a) that technology is an MTD, or (b) to allow the Verification (and sizing) for pretreatment and/or filtration.

- “TAPE” is Ecology’s process for approving emerging & proprietary technologies (MTDs)
- Current TAPE is August 2011, Revised Version in progress

How hard could it be to get some field samples?  
Well, 73 pages worth.



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

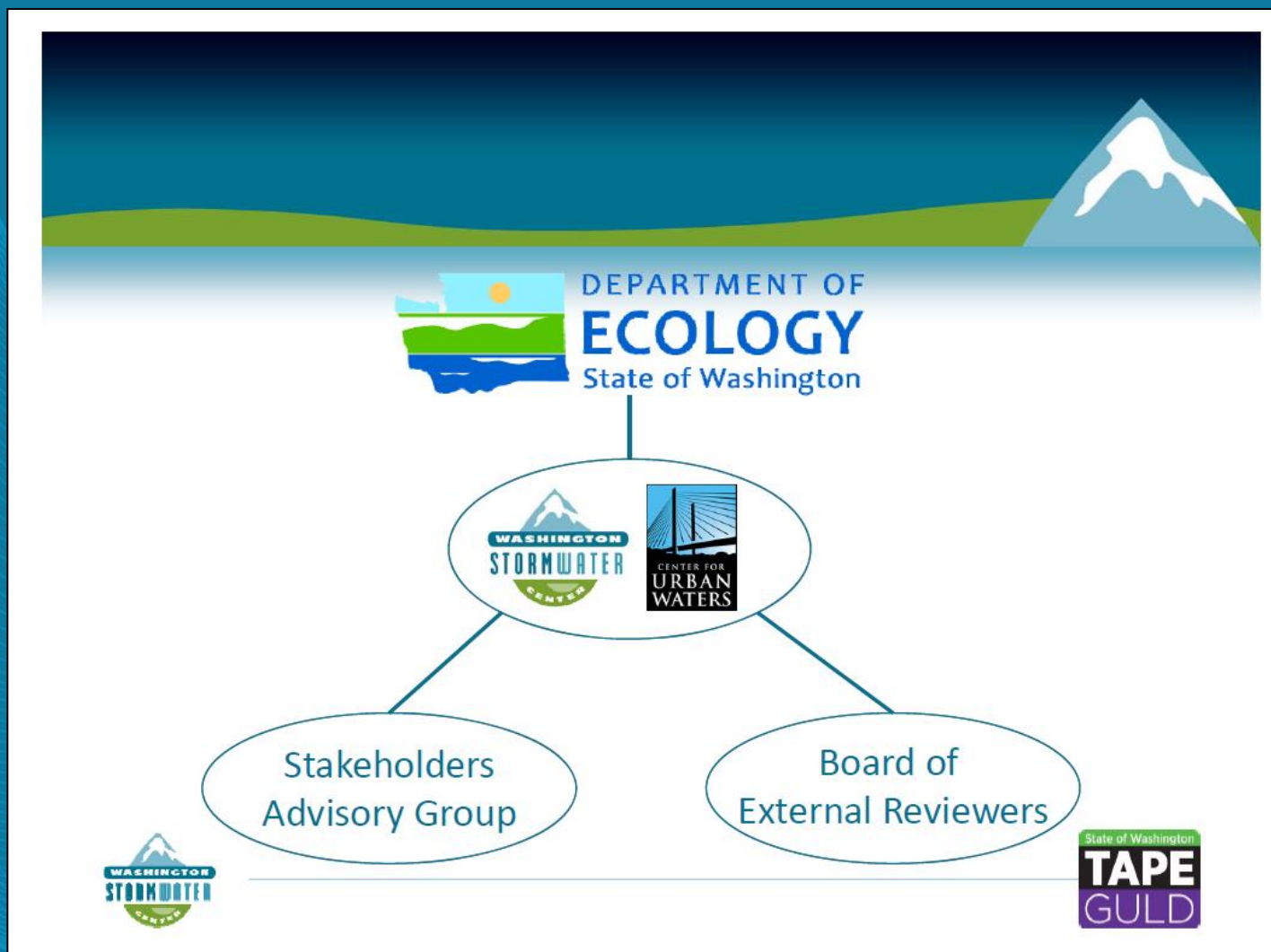
## **Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies**

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**Technology Assessment Protocol –  
Ecology (TAPE)**


August 2011 revision of Publication no. 02-10-037  
Publication no. 11-10-061





Select WDOE/TAPE slides taken from presentation at Washington State Municipal Stormwater Conference, May 17, 2017, Carla Milesi, WSC

<https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies>

 **DEPARTMENT OF  
ECOLOGY**  
State of Washington

Regulations & Permits

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[Stormwater permittee guidance & resources](#)

[Emerging stormwater treatment technologies \(TAPE\)](#)

# Emerging stormwater treatment technologies (TAPE)

Stormwater treatment technologies are reviewed and certified by the Washington state Technology Assessment Protocol - Ecology — better known as the TAPE program.

## Submitting treatment technologies for review

Vendors, designers, and manufacturers who wish to have their treatment technologies reviewed should follow these three steps:

- 1. Follow the TAPE process**

Refer to the [TAPE process overview](#) [↗](#) for everything you need to know about how we evaluate your technology.
- 2. Prepare your technology**

## 2. Prepare your technology

Refer to the [2011 TAPE guidance manual](#) as you prepare your technology for review and certification.

## 3. Send in your application

The [application form](#) and fee must be submitted **both** as a hard copy and digitally to:

### TAPE Program

Washington State Department of Ecology  
Cashiering  
PO Box 47611  
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## We also review chemical technologies

We also accept applications to the Chemical Technology Assessment Protocol – Ecology (C-TAPE) program. See the [construction site chemical technology guidance](#) for more information.





## Approved technologies

The following table lists the devices that have received a designation through the TAPE process.

In addition to our certification, local jurisdiction approval is required (and not guaranteed) for installation of treatment technologies we have evaluated and given a use designation.

| All Pretreatment Oil Enhanced Basic Phosphorus Construction |                                                                 |                 |                             |
|-------------------------------------------------------------|-----------------------------------------------------------------|-----------------|-----------------------------|
| Manufacturer                                                | Device Name                                                     | Treatment Type  | Use Designation             |
| AquaShield, Inc.                                            | <a href="#">Aqua-Filter System, Aqua-Blend C Filter Media</a>   | Basic Treatment | <a href="#">Pilot Level</a> |
| AquaShield, Inc.                                            | <a href="#">Aqua-Filter System, Coarse Perlite Filter Media</a> | Basic Treatment | <a href="#">Cond Level</a>  |
| BaySaver Technologies, Inc.                                 | <a href="#">BayFilter w/ BFC Media</a>                          | Basic Treatment | <a href="#">Gene Level</a>  |
| BaySaver Technologies, Inc.                                 | <a href="#">BayFilter w/EMC Media</a>                           | Basic Treatment | <a href="#">Gene Level</a>  |
| BaySaver Technologies, Inc.                                 | <a href="#">BayFilter w/GAC Media</a>                           | Basic Treatment | <a href="#">Pilot Level</a> |

# Example GULD for Pretreatment (50% TSS per storm)

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April 2017

## GENERAL USE LEVEL DESIGNATION FOR PRETREATMENT

For  
AquaShield™, Inc.'s Aqua-Swirl® Stormwater Treatment System

### Ecology's Decision:

Based on AquaShield™, Inc. application submissions, Ecology hereby issues the following use level designations:

1. General Use Level Designation (GULD) for the Aqua-Swirl® for pretreatment use (a) ahead of infiltration treatment, or (b) to protect and extend the maintenance cycle of a Basic or Enhanced Treatment device (e.g., sand or media filter)
2. The following table shows flowrates associated with various Aqua-Swirl models

| Model | Diameter<br>(ft) | WQF<br>(cfs) |
|-------|------------------|--------------|
| AS-2  | 2.5              | 0.25         |
| AS-3  | 3.5              | 0.64         |
| AS-4  | 4.5              | 1.31         |
| AS-5  | 5                | 1.78         |
| AS-6  | 6                | 2.98         |
| AS-7  | 7                | 4.63         |
| AS-8  | 8                | 6.78         |
| AS-9  | 9                | 9.48         |
| AS-10 | 10               | 12.80        |
| AS-11 | 11               | 16.79        |
| AS-12 | 12               | 21.52        |
| AS-13 | 13               | 27.03        |

# TAPE Use Level Designations

| Use Level Designation | Minimum Data                        | Months (justified extensions allowed) | Max. # of Installations in WA | Field Testing Required                                                            |
|-----------------------|-------------------------------------|---------------------------------------|-------------------------------|-----------------------------------------------------------------------------------|
| Pilot (PULD)          | Lab data                            | 30                                    | 5, Unlimited for Retrofits    | All installation sites to be monitored. At least 1 indicative of or in Pacific NW |
| Conditional (CULD)    | Field data, lab data may supplement | 30                                    | 10, Unlimited for Retrofits   | 1 site indicative of or in Pacific NW                                             |
| General (GULD)        | Field data, lab data may supplement | Unlimited                             | Unlimited                     | None                                                                              |



# Requirements for New/Redevelopment

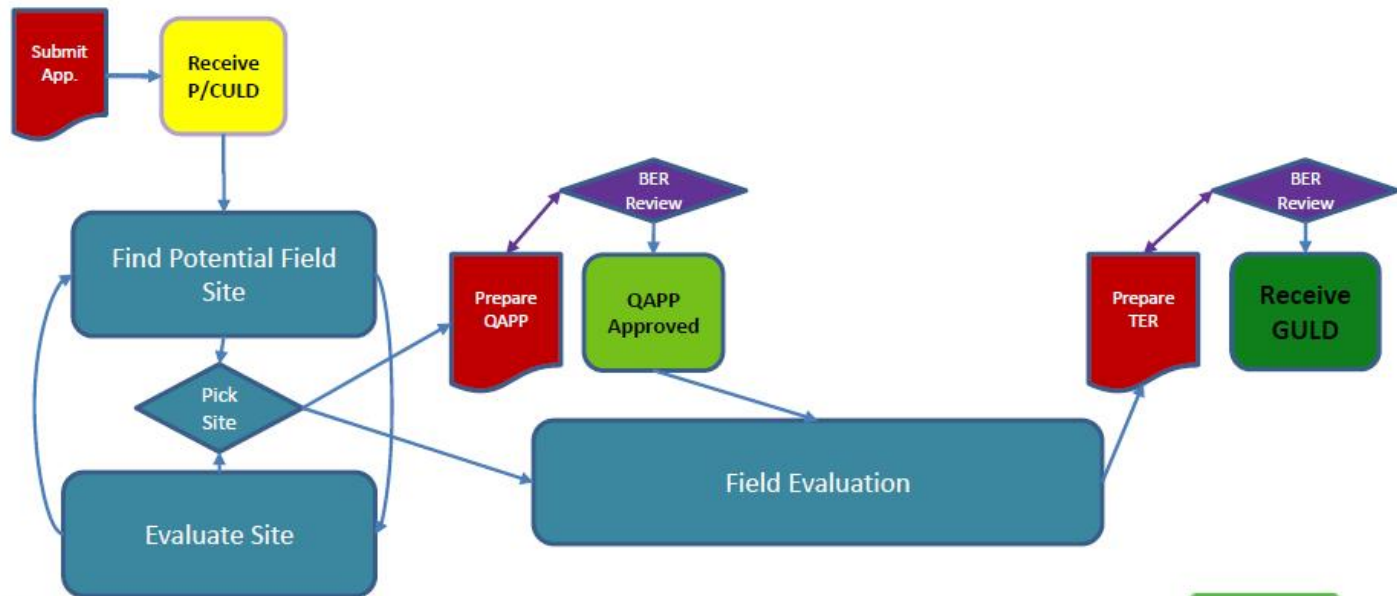
## ◆ Treatment Facilities

- ◆ Pretreatment (Total Suspended Solids)
- ◆ Basic (Total Suspended Solids)
- ◆ Enhanced (Dissolved Copper and Zinc)
- ◆ Phosphorus (Total Phosphorus)
- ◆ Oil (motor oil fraction of Total Petroleum Hydrocarbons)



# TAPE Approval Timeline

~ 3 years, \$250K



## TAPE Performance Goals (per event)

| Performance Goal                  | Influent Range                                               | Criteria                                                                                                                                                                                                                                                                                      | Required Water Quality Parameters            |
|-----------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Basic Treatment</b>            | 20-100 mg/L TSS                                              | Effluent goal $\leq 20$ mg/L TSS <sup>a</sup>                                                                                                                                                                                                                                                 | TSS                                          |
|                                   | 100-200 mg/L TSS                                             | $\geq 80\%$ TSS removal <sup>b</sup>                                                                                                                                                                                                                                                          |                                              |
|                                   | > 200 mg/L TSS                                               | > 80% TSS removal <sup>b</sup>                                                                                                                                                                                                                                                                |                                              |
| <b>Dissolved Metals Treatment</b> | Dissolved copper<br>0.005 – 0.02 mg/L                        | Must meet basic treatment goal and better than basic treatment currently defined as > 30% dissolved copper removal <sup>b,d</sup>                                                                                                                                                             | TSS, hardness, total and dissolved Cu and Zn |
|                                   | Dissolved zinc<br>0.02 – 0.3 mg/L                            | Must meet basic treatment goal and better than basic treatment currently defined as > 60% dissolved zinc removal <sup>b,d</sup>                                                                                                                                                               |                                              |
| <b>Phosphorus Treatment</b>       | Total phosphorus (TP)<br>0.1 to 0.5 mg/L                     | Must meet basic treatment goal and exhibit $\geq 50\%$ TP removal <sup>b</sup>                                                                                                                                                                                                                | TSS, TP, orthophosphate                      |
| <b>Oil Treatment</b>              | Total petroleum hydrocarbons (TPH)<br>> 10 mg/L <sup>e</sup> | <ol style="list-style-type: none"> <li>1) No ongoing or recurring visible sheen in effluent</li> <li>2) Daily average effluent TPH concentration &lt; 10 mg/L <sup>a,e</sup></li> <li>3) Maximum effluent TPH concentration of 15 mg/L <sup>a,e</sup> for a discrete (grab) sample</li> </ol> | NWTPH-Dx, visible sheen                      |
| <b>Pretreatment</b>               | 50-100 mg/L TSS                                              | Effluent goal $\leq 50$ mg/L TSS <sup>a</sup>                                                                                                                                                                                                                                                 | TSS                                          |
|                                   | $\geq 100$ mg/L TSS                                          | > 50% TSS removal <sup>b</sup>                                                                                                                                                                                                                                                                |                                              |



## ***And in conclusion...***

- Both the NJDEP/NJCAT & Ecology MTD approval processes provide robust performance testing programs to serve as models to assist other state/local regulators to evaluate MTD performance claims with greater confidence.
- **MTD testing presents many challenges in the field and lab. Understanding the limitations of both is critical for any performance evaluation.**
- The NJDEP/NJCAT lab-based approach allows for side-by-side comparison of MTD performance claims.
- **Ecology's field-based approach provides long term, real-world performance and functionality to support MTD performance claims based on initial laboratory testing.**
- NJDEP MTD certifications are specific to New Jersey to allow for MTD sales in New Jersey. Just because an MTD may hold NJCAT Verification, that verification may not be eligible for NJDEP Certification. Has significant marketplace implications outside of NJ.

# It's all about good clean water...



Tennessee River, Chattanooga



# Thank you.



INNOVATING GOOD CLEAN WATER

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